

## New records of *Leptothorax* ants with cysticercoids of the cestode, *Choanotaenia uniconornata*, and the rearing of the tapeworm in quails

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Péru, L., Plateaux, L. Buschinger, A., Douwes, P. Perramon, A. & J. C. Quentin (1990): New records of *Leptothorax* ants with cysticercoids of the cestode, *Choanotaenia uniconornata*, and the rearing of the tapeworm in quails. *Spixiana* 13/2: 223–225

Until recently the ant *Leptothorax acervorum* as intermediate host of the tapeworm *Choanotaenia uniconornata* had been found in one site only, in the Italian Dolomites near Dobbiaco, South Tyrol. We report here two new localities, one in the Val Lunga near Selva, also in the Dolomites, the other one near Wallgau in the Isar valley, Bavaria (FRG). The adult tapeworm was reared in numbers by infesting young quails with parasitized ants.

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During the 10th International Congress of IUSSI at Munich two of the authors (P. Douwes and A. Buschinger) collected some colonies of the ant, *Leptothorax acervorum* (Fabr.), on 20 August, 1986, in pine forest along the Isar river, between Wallgau and Vorderriß. These ants inhabited dead branches on the forest floor, or rotting tree stumps. Two colonies contained, besides normal, reddish-brown ants, a number of yellow specimens which were infested by cysticercoid larvae of a cestode (Plateaux 1972, Buschinger 1973, Péru 1982). L. Plateaux kept these colonies in laboratory culture. One colony initially contained a queen, 17 normal and one yellow worker, and some 40 larvae. In the other colony a queen and 31 normal workers, four yellow, parasitized intermorphs ("intercasts"), 17 yellow workers and a few larvae were present. The infested ants looked very similar to those collected by Buschinger (1973) at Carbonin (= Schluderbach, close to Dobbiaco/Toblach, South Tyrol) in the Italian Dolomites. The newly detected site near Wallgau, about 110 km NW of Carbonin, represents the second locality where cestode-infested *L. acervorum* have been found. On 9 July, 1987, A. Buschinger collected one further colony (one normal *L. acervorum* queen, 24 normal workers, two yellow dealate females and 5 yellow workers, numerous eggs, larvae and worker pupae), in the Val Lunga/Langental, near Selva/Wolkenstein in the Dolomites, about 35 km W of the first site at Carbonin.

The parasite of the ants from Carbonin had been identified as *Choanotaenia uniconornata* (Fuhrmann), with some reservation (Buschinger 1973). According to Mettrick (1958) the principal hosts of adult *C. uniconornata* are passeriform birds of the genus *Turdus*. Péru (1982) suggests that piciform birds might belong to the principal hosts of the cestode from South Tyrol. L. Péru dissected some ants from Wallgau, and confirmed that the cysticercoids were identical to those from Carbonin.

L. Péru and L. Plateaux have tried to realize the cycle of the parasite. With the aid of A. Perramon they infested quails (*Coturnix coturnix* [L.]) with yellow ants containing cysticercoids, and obtained a number of adult tapeworms. On 29 April, 1987, seven newly hatched quails ingested one or two parasitized ants each (13 ants in total). The quails were then reared for three weeks.

Five quails unfortunately died prematurely, and it was not possible to check them for tapeworms. The remaining two were dissected, with the aid of J. C. Quentin, on 20 May, 1987. They contained 7 and 49 *Choanotaenia* adults, respectively. These tapeworms (Fig. 1) exhibit the characters of *Choanotaenia unicolorata*, particularly with respect to the shape of their suckers and crooks (Fig. 2), as did already the cysticercoids.

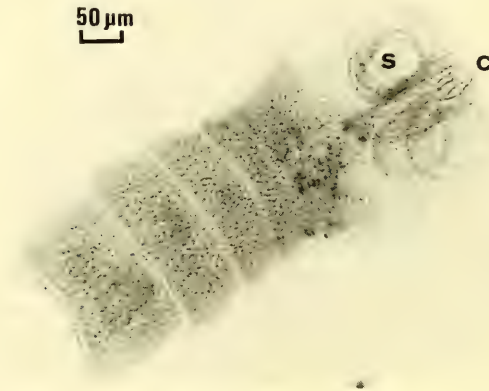


Fig. 1: Young adult of *Choanotaenia unicolorata* with six proglottids. c = crooks, s = suckers

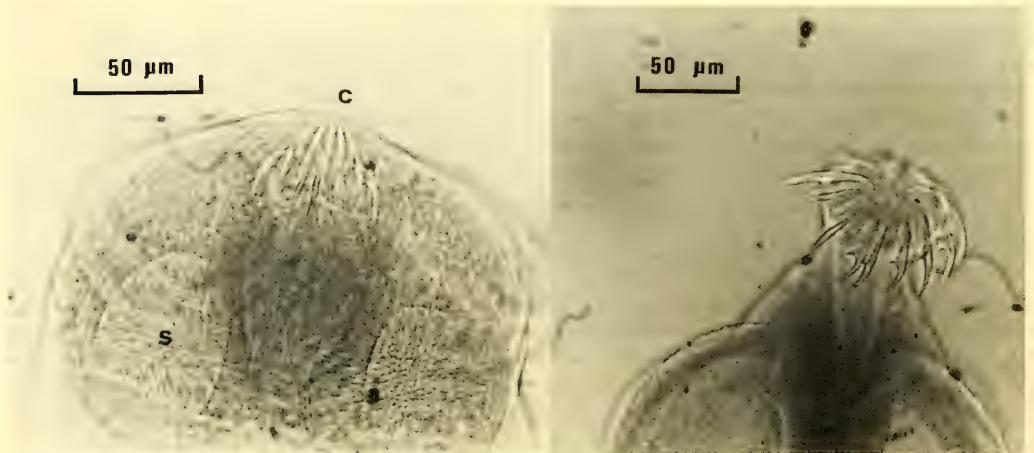


Fig. 2: Anterior part of *Choanotaenia unicolorata* with crooks (c) and suckers (s). a. Invaginated, b. devaginated rostrum.

The adults of *C. unicolorata* are larger than those of *Anomotaenia brevis* (Clere), another cestode having intermediate hosts of the ant genus *Leptothorax*. This tapeworm, a parasite of piciform birds, has also been reared in quails (Péru, 1982; Péru et al., 1989). Of 20 young quails infested by ingestion

of three to five yellow *L. nylanderi*, 11 survived until dissection. Nine of them were parasitized by three to 11 tapeworms, and two did not contain the parasite (mean 4.3). This result, however, was only possible with a particular experimental diet for the quails. *A. brevis*, thus, is apparently not very well adapted to parasitization of a galliform bird like the quail.

*C. unicoloronata*, on the other hand, is more able to develop in the quail with the same special diet. A high fraction of the infested birds have died, perhaps because of a too heavy parasitization, but the two surviving ones contained comparatively many adult tapeworms, namely seven and 49, respectively. This fact suggests that in nature certain galliform birds might belong to the principal hosts of *C. unicoloronata*. In the mountainous areas where infested ants have been found, the black grouse (*Lyrurus tetrix* [L.]) and the hazel hen (*Tetrastes bonasia* [L.]) are possible candidates for this role.

With respect to host specificity of the two tapeworms it is remarkable that *C. unicoloronata* cysticeroids have been found in *Leptothorax* (*Leptothorax*) *acervorum* and two of its (related) social parasites, the inquiline ant, *Doronomyrmex kutteri* (Buschinger), and the slave-maker *Harpagoxenus sublaevis* (Nylander), both at Carbonin, South Tyrol (Buschinger 1973, Péru 1982), but only once in a *Leptothorax* species belonging to the subgenus *Myrafant* (*L. nigriceps*, at Carbonin, Péru, 1982). *A. brevis*, in contrast, is parasitizing a number of *Leptothorax* (*Myrafant*) species, among them most frequently *L. nylanderi*, but was never met with in a species belonging to the subgenus *Leptothorax* (Buschinger 1973, Péru 1982).

A final problem refers to the ranges of the two cestode species. *A. brevis* occurs in numerous sites in France and West Germany, whereas *C. unicoloronata* as a parasite of *Leptothorax* has yet been found in three sites only, all in the Alps. We may suspect that it is more widespread in Europe, too, however, in some regions where *L. acervorum* is abundant, the cestode is evidently lacking. In the three sites where *C. unicoloronata* has been found it is present in one out of 10 to 20 ant nests checked. But in the vicinity of Nuremberg (Bavaria), A. Buschinger and his coworkers have collected or checked, over 25 years, more than 5.000 *L. acervorum* colonies, and did not find any infested. Several hundred colonies of this ant have been checked also in the Aosta valley (Italy), in the Swiss Valley (Switzerland), near Briançon (French Alps), in the Pyrenees (France/Spain), and in S-Sweden (where P. Douwes has collected about 1.500 *L. acervorum* colonies). It is as yet not possible to provide any explanation for the apparent lack of *C. unicoloronata*-infested ants in all these areas. According to Mettrick (1958), *C. unicoloronata* is a widespread parasite of *Turdus*, hence infested ants could occur in all the localities mentioned above.

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